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ABSTRACT

Correspondence course training (CCT) systems, primarily in the military and government sectors, were surveyed to identify their critical problems. Other study objectives were to formulate the basic design of a CCT system to solve these problems and identify course completion factors and trends in systems operations. Seventeen CCT organizations were surveyed, including eight in the Navy or Marine Corps and nine in the other military services, Department of Defense, other governmental agencies, and the civilian sector. The survey instruments were a questionnaire and structured interview. The most important findings were that course completion rates ranged from the first to fourth quartile and that noncompletion was the most critical problem. Twenty-four factors affecting course completion rates were identified, and current trends in CCT system operations were noted. Relevant literature was reviewed to verify the common conception that the overwhelming problem of CCT is course noncompletion. It was concluded that the primary cause of attrition in CCT is the students' inability to organize effectively and conduct the information processing necessary to complete the course. Recommendations were inclusion of the course completion factors in CCT and refinement, augmentation, and validation of these factors. (YLB)

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A SURVEY OF CORRESPONDENCE COURSE TRAINING

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A survey of 17 correspondence course training (CCT) systems, primarily in the military and government sectors, resulted in (1) a summary description of system aspects, (2) the identification of course noncompletion or student attrition as the most critical problem, (3) a list of factors that tend to increase course completion rates, and (4) identification of some trends in system operations. A survey of the CCT literature also indicated that course noncompletion is the most critical problem.

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FOREWORD

This research and development was conducted in support of exploratory development task area ZF55-522-002 (Methodology for Development and Evaluation of Navy Training Programs), work unit ZF55-522-002-03.42 (Strategies for Nonresident Training). The results are intended for use by directors of correspondence course training systems in the Department of Defense and elsewhere in the federal government.

Appreciation is expressed to the directors and staffs of the surveyed correspondence course training organizations for their cooperation, and to Mr. Michael Lambert of the National Home Study Council for his assistance.

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SUMMARY

Problem

Correspondence course training (CCT) in the Navy and Marine Corps comprises a nonresident training mode of considerable magnitude. There are about ten different CCT systems with over 500 courses and a yearly enrollment of over one-half million students. The sheer size and cost of CCT justify efforts to identify and solve its major problems. However, solutions must not significantly degrade the basic advantages of CCT; namely, low cost and administrative flexibility.

Objective

The objectives of this effort were to identify the most critical problems of CCT and to design a CCT system that could solve selected problems without degrading the low cost and flexibility of CCT. Additional objectives were to identify course completion factors and trends in systems operations.

Method

1. Military and other CCT systems were surveyed to identify their critical problems and to examine system environments, operations, and outcomes. The survey included a personal visit, a structured interview with an executive head, and the administration of a questionnaire.

2. Relevant literature was reviewed to verify the common conception that the overwhelming problem of CCT is course noncompletion.

Results

The most important findings were that course completion rates ranged from the first to the fourth quartile and that noncompletion was the most critical problem. More than 20 factors that affect course completion rates were identified and current trends in CCT system operations were noted.

Conclusions

Analysis of the course noncompletion problem indicates that the CCT system is responsible for determining what to teach and how to teach it, but the student is left with the responsibility for discovering how to learn it. In many cases, the student is not meeting this challenge adequately.

Recommendations

1. Current CCT organizations should ensure that as many of the 24 course completion factors listed on pages 10 and 11 are present as possible. These include making course consequences job-related, aligning the subject matter of the courses and current on-the-job training, exerting command pressure, and using high quality course materials.

2. These same course completion factors should be refined, augmented, and validated in the CCT systems surveyed. A central agency in the government or in the civilian sector (such as the National Home Study Council) should coordinate this effort.

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INTRODUCTION

Problem

Correspondence course training (CCT) in the Navy and Marine Corps comprises a nonresident training mode of considerable magnitude. In all, there are about 10 different CCT systems with over 500 courses and a yearly enrollment of over 500,000 students. The sheer size and cost of this nonresident training mode justify efforts to identify and solve its major problems. However, problem solutions must not significantly degrade the basic advantages of CCT (i.e., low cost and flexibility) or succeed at the expense of increasing the training burden of the fleet and shore stations. This latter requirement was emphasized by the Commander in Chief, U. S. Pacific Fleet, in a memorandum to the Chief of Naval Education and Training.[1]

Objectives

The objectives of this effort were to identify the most critical CCT problems and to formulate the basic design of a CCT system that could solve these problems, without degrading the low cost and flexibility of CCT. Additional objectives were to identify the factors that underlie completion and noncompletion of correspondence courses and to determine trends in CCT system operations.

APPROACH

The approach consisted of (1) a survey of selected CCT systems to identify critical problems and to examine system environments, operations, and outcomes, and (2) a literature review of CCT student attrition and the actions taken or proposed to alleviate this problem.

A total of 17 CCT organizations was surveyed. These organizations, which are listed in Appendix A, included eight in the Navy or Marine Corps (all except a few special and limited systems) and nine in the other military services, DoD, other governmental agencies, and the civilian sector. Also, a listing of critical problems in CCT was obtained from the National Home Study Council, the trade association of the CCT industry.

The survey instruments were a questionnaire and a structured interview. The questionnaire, which was aimed at identifying major problems, consisted of two parts to be completed anonymously by one or two system executives and returned. Part one of the questionnaire asked the executive to list and rank the three or four most critical problems facing his organization. Part two consisted of 10--later expanded to 13[2] -- Likert-type agree-or-disagree problem statements of possible CCT problems derived by analyzing training systems in general. It was administered to CCT executives as a check to ensure that no significant problems were overlooked. The final form of the questionnaire is provided in Appendix B.

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[1]Commander in Chief, U.S. Pacific Fleet ltr FF1-1 3500 Ser 35/4007 of 26 May 1977 to Chief of Naval Education and Training; subj: On-board training.

[2]The latter three items were proposed by early participants.

The structured interview form (Appendix C) covered system environments, operations, and outcomes. It required about 60 minutes to complete. Following the interview, one or more courses at each organization were examined and a sample course was obtained for later review and analysis. Each participant was assured that his organization and its identifying characteristics would not be specifically mentioned, except in a positive sense.

Relevant literature was reviewed to verify the widely-held opinion that noncompletion is the overwhelming CCT problem and to determine what actions have been taken or proposed to solve this problem. Military research in the CCT area was assessed and CC attrition was compared with college attrition. In such a comparison, student populations and training modes differ; however, it was felt that some useful insights might be obtained, since much more research has been done on college attrition.

For comparison purposes, CCT systems were divided into two types: education systems, which include senior military and higher level courses such as found in universities and colleges, and training systems, which cover more specific job-level courses. Predominant student type, enrollment, student body size, and number of courses for these two types are summarized in Table 1.

Table 1

Characteristics of Education and Training CCT Systems

Characteristic	Education CCTs (N = 5)	Training CCTs (N = 12)
Predominant Student Type	Officer (Active and Reserve)	Enlisted (Active and Reserve)
Enrollment	Voluntary	Mandatory (some voluntary)
Student Body Size (Range and Mode)	600-10,000; 4,000	1,000-300,000; 100,000
Number of Courses (Range and Mode)	1-156; 47	11-2,200; 100

RESULTS AND DISCUSSION

Survey of CCT Systems

Comparison of Education and Training CCTs

Various aspects of education and training CCTs are discussed in the following paragraphs.

1. Course Development.

a. Education CCTs. Correspondence courses are mostly identical to or shortened counterparts of resident courses and are developed by resident faculty as an added duty in most systems. Control, if any, and training of these developers is a problem. In some systems, courses are developed primarily on the basis of training objectives. Outside readings are important requirements in several systems.

b. Training CCTs. About half of these systems have an in-house course development operation complete with procedures manuals, educational specialists, and subject matter experts (SMEs). Several depend on a resident school faculty and two use outside experts on a contract basis. Most claim to follow the instructional systems development (ISD) model[3] or some variation thereof. Many have elaborate procedures for review of newly developed courses by job incumbents and command personnel.

2. Course Materials.

a. Education CCTs. System course materials consist mainly of texts, assignment sheets or booklets, tests, brief student guides, and, in the case of the Naval Postgraduate School (NPS), a tutor's guide. The NPS is unique in that its correspondence courses use the Keller Personalized System of Instruction (PSI), complete with tutors in the field for each individual student. See Ryan (1974) or Keller (1968) for a description of this system.

b. Training CCTs. Here, materials were more varied due to the technical nature of the courses offered. Again, they consisted mostly of texts, assignment booklets, brief student guides, and tests with and without instant knowledge of results (IKOR). IKOR answer sheets, where the choices are hidden until one is erased to provide IKOR, are used mainly in the Navy. Several systems use commercial texts plus assignment booklets, tests, etc. A number use programmed texts, sound and slide, cassette tapes, instruments, or equipment to augment certain courses.

3. Course Updating.

a. Education CCTs. Most of the systems depend on a resident school staff to update the correspondence courses after the resident counterparts have been updated. There is a predictable lag. Student feedback is a major stimulus in the updating process.

b. Training CCTs. Almost all systems depend on student complaints and internal analysis as updating cues. Changes in military regulations and civil legislation stimulate updating in several systems. Other systems specify an updating or recycle period and a few follow their resident school updates. The updating problem usually boils down to a cost versus obsolescence tradeoff, or a question of how long obsolete material can be tolerated before complaints or regulations force the allocation of resources for updating.

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[3]The military Instructional System Development (ISD) model is the presently accepted triservice set of procedures for building a course as described in NAVEDTRA 106A. (Branson, R. K., Rayner, G. T., Cox, J. G., Furman, J. P., King, F. J., & Harnum, W. H., 1975).

4. Course Instructional Process.

a. Education CCTs. All systems use the conventional read/study of prose text method, which may include answering questions and solving problems. The student then takes paper-and pencil lesson subtests and eventually some sort of paper-and-pencil final test, usually unmonitored.

b. Training CCTs. All systems primarily use the basic read/study of prose text method, which may include answering questions and solving problems. The student then takes a paper-and-pencil lesson test and, eventually, in the majority of the systems, a monitored final test. Five or six of the systems have no final tests but use the average of the lesson test scores for a final course grade. Most of the systems have courses in which the text is mostly pictures and/or courses that are mostly sound-and-slide presentations. There is also an occasional programmed text course where the student does considerable writing.

5. Instructor Role.

a. Education CCTs. In most of the systems, essays, reports, and tests are graded by an instructor, who adds comments designed to aid and encourage the student. At the NPS, the PSI system extends this to one-on-one, face-to-face tutoring. All systems have some provision for answering student queries by phone, letter, or both.

b. Training CCTs. Few, if any, of these systems provide a personal instructor-student relationship. Student body size precludes such interactions. All have a hot line and/or letter service for answering student questions. Many of the systems provide direct, but sparse and impersonal, computer printout feedback regarding test items missed as a substitute for instructor interaction.

6. Lesson Tests.

a. Education CCTs. Most systems have instructor-scored objective or essay-type lesson tests, while several provide, as learning devices, tests complete with answers.

b. Training CCTs. The majority of systems use agency-scored lesson tests. Several use lesson tests complete with open answers, while four use the hidden answer self-scoring IKOR lesson tests, which are usually verified by another party.

7. Final Tests.

a. Education CCTs. All have some sort of final test or a computed average of scores earned during the course, which is used in lieu of a final test score. Finals of the essay and report type are not monitored. Objective finals, except for one system, are monitored. Minimum passing scores range from 60 percent to 74 percent, with 70 percent as the mode. There is some provision for retest or make-up action, if a final test is failed.

b. Training CCTs. Most of the systems use controlled or monitored final tests of the objective type. Passing scores range from 60 percent to 80 percent, with 70 percent as the mode. If the final is failed, many of these systems provide one or even two retests. Systems that use the averaged lesson test scores of the IKOR type set passing scores of 3.4 on a four-point scale (85%) for officers and 3.2 (80%) for enlisted personnel. IKOR passing scores are not comparable with those of other final tests. Since there is usually no test control, scores and retakes of any IKOR type tests could depend on whether another copy of the course is readily available.

8. Student Tracking.

a. Education CCTs. All systems use some variation of the reminder ("your assignment is overdue") letter and/or disenrollment notice when assignments are not returned.

b. Training CCTs. Almost all systems use some form of the reminder letter and/or disenrollment notice when assignments are overdue. Some notify the student's commanding officer and several send a monthly status report to each military unit with CC students.

9. Student Incentives.

a. Education CCTs. System incentives are course completion letters or certificates, diplomas, enhanced promotion potential, college credits, reservist points, and knowledge enhancement.

b. Training CCTs. Practically all systems issue a letter or certificate of course completion. The majority require satisfactory course completion either as a prerequisite for a promotion examination or as a means of compiling promotion points. Other incentives include points for the relicensure of professionals and reservist points. Some courses are command-mandated.

10. Student Survey. Practically all of the CCT systems--both education and training--use some sort of student course evaluation or comment sheet. Few, if any, have conducted in-depth student surveys.

11. Unit Feedback.

a. Education CCTs. The non-job-specific and voluntary nature of educational CCs precludes feedback to the CCT regarding the effect of course completion on job performance in the unit.

b. Training CCTs. Only a few systems have any systematic procedure for obtaining feedback regarding the effect of course completion on job performance in the unit.

12. Course Completion Times.

a. Education CCTs. As one would expect, course completion times correlate roughly with the amount of course material. These times range from 3 to 24 months with the mode at 8 or 9 months, when one 30-day extention and administrative time of 30 days are included. A 30-day period is also popular for suggested completion of an assignment. Most systems have a liberal time extension policy.

b. Training CCTs. Course completion times range from 1 week to 3 years. Most of the courses are in the 6-month to 12-month span, plus 30-day extensions and administrative time. The 30-day assignment period is also popular and extension policies are quite liberal. Completion times in one system were unknown.

13. Course Disenrollment.

a. Education CCTs. For most systems, the official catalogue suggests that students will be disenrolled if final assignments are not received within the designated

completion time, plus one 30-day extension, or if the student fails the final test two or three times. In practice, except for one or two systems, the reminder letters, the disenrollment notice, and liberal extension policies can stretch completion time considerably, especially when delays are attributed to the United States Postal Service.

b. Training CCTs. In most of the systems, students are disenrolled if they fail to return an assignment 6 months after the designated course completion time, if they fail the final test two or three times, or if they fail to return the initial assignment in 6 to 12 months. Several systems follow their guidelines fairly closely. However, others follow administrative policies that maintain student eligibility for a prolonged period. Keeping the nonactive student enrolled is rationalized by the argument that the primary aim is to get the student to complete the course, acquire the knowledge, and thus realize the return on the investment. Counter arguments make the points that (1) keeping the nonresponding student on the rolls masks the completion rate, and (2) taking excessive time to complete the course may diminish the readiness or effectiveness of the student's operational unit for that period.

14. Course Completion Rates. All course completion rates are estimates, since many systems lack precise data and procedures with which to compute exact completion rates. In all systems, a variety of factors differentially affect such rates. Factors that affect course completion rates are discussed in a later section of this report (pp. 14-16).

a. Education CCTs. Estimates of course completion rates for the five education CCTs range from the first to the fourth quartile, with one falling in the first quartile, one in the third, and three in the fourth.

b. Training CCTs. Estimates for the 12 training CCTs range from the first to the fourth quartile, with one falling in the first quartile, two in the second, three in the third, and five in the fourth. No estimated rate was available for one system, but there was a general impression that it was in the third or fourth quartile.

15. System Costs. System costs are even more difficult to estimate than completion rates, since they depend on a multitude of factors. These costs become more meaningful if they are compared to those incurred by equivalent resident training. While such comparisons are relatively few, they can, along with related information, provide a reasonable estimate of CCT costs.

a. Education CCTs. System cost estimates are based on different indices. One system estimated its cost as $32 per credit hour, compared to $266 per resident credit hour, or about 12 percent of the cost of equivalent resident training. Another estimated its cost per student graduate as $150 for a 1-year course, compared to a similar, but somewhat shorter, resident course where the pay alone for an officer student graduate was in the thousands. Still another system listed the average costs of student course materials at $1.50.

b. Training CCTs. One large system reported an average cost per course graduate of about $70 and a second a cost of $40. A third system sells and services its courses to government agencies at $10 to $90 per course; another, to private industry at $10 to $40 per course; and still another, to individual students at $200 to $1400. Although the other systems surveyed can present budget totals for their operation, they lack a comparative base such as the cost of equivalent resident training or other measures that can provide some basis for inferential comparison.

A recent authoritative cost figure of $25,000 per resident-trainee year provides one standard that puts the above estimates in some perspective (Alluisi, 1977). A study at the Center for Naval Analysis (Warner & Waterman, 1977) indicates that about 70 percent of Navy resident training costs are for pay and travel of instructors and students. CC systems avoid these costs and the costs of acquiring and maintaining schools and quarters for students and instructors.

Low-cost training is no bargain, however, if the CC student learns significantly less than does an equivalent resident student. Mathieson (1971), in a summary review, lists 10 studies that indicate CC students perform just as well as do resident course students. Childs (1966), in a similar review covering 16 studies, summarizes their results, saying there were no studies of achievement showing that CC students do not perform as well as do classroom students, a number that show they do perform as well, and a number that show that they perform better. Hosmer (1959) found that, although there was no difference in CC and classroom student achievement, the cost per CC student hour was $.92, compared to $5.21 per resident student hour (about 18% of resident study cost). Such findings largely eliminate a factor that could vitiate cost comparisons between CC and resident systems.

Based on the available data, it is reasonable to infer that the cost of CC systems is 10 percent to 25 percent of the cost of resident systems. Thus, even if it costs another 10 to 25 percent to redesign CCT to match resident completion rates and achievement standards, large savings in manpower and dollar costs may be possible.

Current Problems in CCT

Nineteen questionnaires were returned. The 65 problem statements that appeared in part one were abstracted, recast into wording that specified some deficiency, and sorted into five categories based on judged relationships. Table 2, which lists categorized CC problems, shows that course noncompletion and lack of motivation were each mentioned ten times in the 19 returns. Respondents felt that the primary causes of these problems emanated from administrative delays and course and student inadequacies. It seems that the student plays an undefined and poorly understood role in contributing to these areas of concern in CCT.

Twelve respondents answered the Likert-type problem statements in part two of the questionnaire, except that the last three statements, which were added later, were answered by nine, nine and six respondents respectively. Responses are provided in Table 3, which shows that no new problems were identified with the possible exception of respondents' concern that the students tend to search the text for answers to specific questions rather than study the text (Item 9). This problem is readily subsumed under the "course quality" category (Table 2).

Two respondents contended that the student knowledge level at course end is too low (Item 1); three, that the level at 3 to 6 months later is too low (Item 4); and three, that cost per course completion is too high (Item 10). These issues can be attributed to course inadequacies, student inadequacies, or both. Solving the course noncompletion problem would directly reduce the cost per course completion and perhaps raise the level of student knowledge.

Five respondents agreed that course content was not directly relevant to job performance (Item 7). Four mentioned this problem ("inadequate course/job content match") in responding to part one (Table 2). These responses identify an old and well-researched problem, which can be solved, for the most part, by adhering to ISD model procedures for task analysis and determination of objectives.

Table 2

Correspondence Course Problems
Identified and Ranked by Respondents

	Category	Component Problems	Frequency	Ranking Frequency 1st	2nd	3rd to 5th
1.	Completion	Noncompletion of courses	10	5	1	4
		Inadequate motivation	10	2	3	5
		Courses take too long	4	1	3	0
2.	Postal delay		4	1	1	2
3.	Course quality	Inadequate course/job content match	4	3	1	0
		Inadequate courses	3	1	1	1
		Inadequate measuring procedures	3	1	0	2
		Inadequate course pretesting	3	1	1	1
		Inadequate training of course developers and instructors	2	0	2	0
4.	Student-related	Learning burden on student	2	0	1	1
		Inadequate student tracking	2	0	0	2
		Lack of appropriate student background	1	0	1	0
		Differences in student reading skills	1	0	0	1
		Poor student attitudes	1	0	0	1
		No behavioral change in student graduate	1	0	1	0
		Inadequate student document identification	1	0	1	0
5.	Miscellaneous	Excessive number of courses	3	1	0	2
		Inadequate training mode selection procedures	2	0	0	2
		Second class status of CCT	2	1	0	1
		Duplication of existing CCT materials	1	0	0	1
		Duplication of related CCT systems	1	0	1	0
		Lack of CCT research	1	0	0	1
		Relative effectiveness of CCT mode	1	1	0	0
		Inadequate CCT selling approach	1	1	0	0
		Overregulation of CCT	1	1	0	0
	Total		65			

Table 3

Responses to Part Two of the Questionnaire

Item	Response: Agree[a]	Don't Know	Disagree[b]	Total
1. The average level of student knowledge at course completion is too low.	2	2	8	12
2. Too many students take too long to complete a course.	7	3	2	12
3. The number of students who do not complete their courses is too high.	7	1	4	12
4. The average level of long-term (3-6 months) retention of acquired knowledge after course completion is too low.	3	6	3	12
5. Student attitudes toward the course teaching method are poor.	3	1	8	12
6. Too many students do not have the necessary prerequisites for the courses they select.	2	2	8	12
7. The content of the courses is not directly relevant to performance of the jobs they cover.	5	2	5	12
8. The make-up and/or administration of courses are conducive to student cheating	3	1	8	12
9. The make-up and/or administration of course are conducive to text search for answers to questions rather than text study.	8	0	4	12
10. The cost per course completion is too high.	3	2	7	12
11. The teaching method used puts most of the learning burden on the student.	8	0	1	9
12. In general, the correspondence courses offered do a poor job in motivating the students to learn.	3	0	6	9
13. Delay in responding to student input is the most important factor contributing to noncompletion of courses.	1	0	5	6

Note. Items 11 through 13 were answered by fewer respondents because they were added to later versions of the questionnaire.

[a]Agree responses include "strongly agree," "agree," and "inclined to agree."

[b]Disagree responses include "inclined to disagree," "disagree," and "strongly disagree."

Two thirds of the respondents claimed that student cheating is not a significant problem (Item 8), and five of the six who responded to item 13, disagreed that delay in responding to student input is an important factor in course noncompletion.

Correspondence Course Completion Factors

Students are likely to finish CCT if the conditions listed below are present. The first four seem to be the most influential.

1. Course consequences are directly job- or career-related.

2. Information-processing capabilities of the students are high, as roughly indexed by the number of years of student education.

3. The course subject is the same as the current CJT subject.

4. Command pressure is present, as evidenced by command monitoring and command expectations, counseling, time off for studying, tutoring, etc.

5. Course materials are of high quality as exemplified by ISD developed texts, integrated student practice, varied student responses, population-matched reading levels, etc.

6. Courses are subdivided into multiple subcourses for easier completion.

7. Student-instructor relationships are based on lesson-correction interactions.

8. Course content consists of all or mostly review material.

9. The student is in a position to recognize when course content accurately matches job needs.

10. Course content is incomplete and/or is less difficult than the actual job.

11. Students are not officially enrolled until the first lesson is received.

12. The first two or three lessons are simple and fairly easy.

13. Students with low information-processing capabilities are not accepted.

14. There is no final test.

15. The final test has a low passing score.

16. The final test is made up of identical items from lesson tests that have been scored and the wrong answers corrected.

17. Students are permitted one or two retakes of the same final test.

18. Test credit is given for questions answered correctly, even after one or two attempts.

19. Test administration is not monitored.

20. Test compromise is likely.

21. A student hot-line and a letter-answering service is available.

22. Course completion-time policy is liberal.

23. Completion rates are computed by letting reenrollments cancel previous disenrollments or by not counting nonstarts.

24. Reported completion rates are based on lesson, rather than course, completions.

In several instances, the reported completion rates of some systems are not in accord with what might be expected, considering most of the factors operating in those systems. Such discrepancies can readily be accounted for by identifying a critical factor whose intensive application or emphasis has magnified the effect of other factors to produce an unexpected completion rate. The preceding list of factors provides a practical, if preliminary, base from which to predict a completion rate that is usually valid or to derive a rational explanation for a seemingly aberrant rate.

Current Trends in CCT Systems Operations

Identified trends in CCT systems operations, defined here as the increasing use of a practice for performing a CCT system function, are discussed below in the order of their assessed strength or importance.

1. Automated and Semiautomated Lesson Test Scoring. Student body size and the number of lesson tests encourage the use of computers for test scoring and other document processing. Automated test scoring, which is already widely used, will become more prevalent due to its lower costs. Self-scoring lesson tests of the IKOR type used in the Navy have the potential for wider usage for several reasons:

a. They embody a training method--questions with immediate answer feedback--that is somewhat comparable to training procedures used by some classroom teachers.

b. They eliminate the need for agency-scoring and test monitors as well as two mailings, additional document handling and recordkeeping, and student feedback delays.

c. By combining them with a monitored final test, criticisms regarding the cheat-proof aspects of the self-scoring mechanism become less important.

2. Division of Courses into Subcourses, Minicourses, and Modules. There seems to be a growing realization that long courses can act as demotivators. In addition, when many jobs are covered in one course, the students may not be able to acquire all of the knowledge and capabilities to perform all of these jobs well. Expanding a small segment of a long course into a separate job subcourse might solve both problems.

3. Accreditation by an Outside Agency. Many systems are accredited by the American Council on Education; and others, by the watchdog trade association of the CC industry, the National Home Study Council. The latter seems somewhat more appropriate for CCT systems.

4. Command Involvement. As the search for methods of ensuring course completion continues, more CCT systems will involve the student's command structure to a greater degree. More attention should be given to providing incentives and to eliminating disincentives for commanders who accept this responsibility.

5. More Personalized Student/Agency Interactions. Efforts to provide quicker and more personalized services to students are viewed by most system heads as highly desirable and worthy of continued experimentation.

6. Practice Final Test. Use of a practice final test that comes with answers and a review sheet, or one without answers for agency scoring, can provide the student with the needed practice and feedback, and the agency with assurance that the official final test will be passed.

7. Trial Examination of a Course or Course Sample. Where courses are substantial and relatively costly, trial examination or previews of the course materials and procedures provide the student with the information that he needs to make an official enrollment decision.

From the above, it is apparent that innovative or experimental trends are not widely evident in a training situation constricted by low budgets and an advantageous but traditional instructional delivery system. Pressure to substitute CCT for some resident training may alter the status quo. NPS, which has adapted Keller's PSI to its CC operation, is a case in point.

Literature Review

According to Mathieson's (1971) 20-year summary review of research and development in CCT, the most persistent and critical problem area is student attrition. He lists ten studies covering 55 university extension schools with completion rates ranging from 35 to 76 percent with a mode of about 60 percent. These are inflated rates, since the completion formula used did not include those who enrolled but did not send in the first lesson.

In the military sector, the U. S. Congress terminated the world-wide United States Armed Forces Institute (USAFI) correspondence course program because of a reported course completion rate of about 25 percent. This drastic action exemplifies the seriousness of the course completion problem.

Course Completion Factors Common to All CCT

1. Students' Reasons for Noncompletion of Courses. Three separate surveys were conducted to determine why students did not complete their correspondence courses (Sloan, 1965; Fairing & Hughes, 1950; Brandt, 1956). All surveys resulted in a somewhat standard list of reasons: lack of time, interfering interests, change of plans, poor courses, illness, and loss of interest. Brandt, in addition, listed difficulties with the mechanics of studying and lesson completions and course problems. A later review of about 20 surveys of adult self-learners by Tough (1979) indicates, among other things, that the self-learners have the most difficulty in "knowing how to start their learning projects (setting objectives), finding or making time to learn (setting subobjectives and scheduling), and knowing whether or not they were progressing or had accomplished what they had set out to do."

2. Completers vs. Noncompleters. Factors in studies and surveys made from 1956 to 1970 indicated the following:

a. While there may be a slight tendency for those of greater mental ability to complete courses, this cannot be said of all courses investigated. One course where the reverse is true is shorthand, which demands motor skills as well as mental ability (Childs, 1963).

b. Inability to meet deadlines and a lack of text-processing experience seems to differentiate between completers and noncompleters, but study habits do not (Hughes, 1956).

c. Groups using how-to-study materials have a significantly better completion rate than do those who do not (Wilson, 1968).

d. Goal clarity and the need to sustain motivation are essential (James & Wedemeyer, 1959). Subsequent studies support this conclusion.

An overview of research on the completion problem by Donehower (1968) disclosed additional factors:

a. A relationship exists between completion and the time before the first lesson is submitted. The longer the time, the less chance of completion.

b. A realistic and practical reason for enrolling enhances successful completion.

c. Previous educational experience is related to completion.[4]

d. The farther the student lives from the correspondence school center, the less likely he is to complete the course.

e. Older students are more likely to complete courses than are younger students; and females, more than males.

3. Student Motivation and Course Completion. Researchers have concentrated on two aspects of CCT as the primary means of sustaining student motivation and increasing completion rates: The role of the instructor and the design of the course. Many agree that the student-instructor lesson-correction interaction is critical in sustaining motivation that results in course completion. Wentworth (1969) provides a guide for CCT, which illustrates the principle that, although the CC instructor may never see a student, he acts as a substitute for the classroom teacher. Erdos (1967) adds a secondary requirement: Counseling on course-related topics must be available to the CC student as much as it is in any resident school, if motivation is to be sustained.

4. Course Design Format and Course Completion. Both Wentworth and Erdos advocate an approximation of the ISD model, in terms of objectives, organization, sequencing, and teaching aids. They also stress the need for a study guide containing an introduction, assignments, questions, study notes, tests, and everything else that would be used in classroom instruction.

5. Delivery Method and Course Completion. Efforts to increase the effectiveness and completion rate of correspondence training have focused on changing the conventional instructional delivery method. Different delivery methods, such as programmed instruction, radio, television, computers, satellites, the occasional or periodic intervention by teachers or counselors, etc., have been investigated (Harrison & Stolurow, 1975). In cases

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[4]Studies by Northcutt, Selz, Shelton, Nyer, Hickok, & Humble (1975) and Young and Jamison (1975) indicate that the number of years of education is highly predictive of adult reading ability.

where the changed delivery methods have proved to be more effective, costs have increased and flexibility has been reduced. The cost effectiveness of such changes, especially when effects of reduced flexibility are included, has not been demonstrated.

Military CC Research

The Navy tried CCT as early as 1919, the Marines in 1920, and the Army in 1941. The widely known and now defunct USAFI program began in 1943. Short and McCombs (1966) confirmed the feasibility of programmed instruction in Navy correspondence courses, but recommended a cautious approach in implementing the concept. Cost, lack of student motivation, changing instructional objectives, and other problems served to detract from, but not vitiate, the potential of the programmed instruction approach in Navy CCT. A summary of significant findings noted in Navy CCT research that affect student performance follows.

1. Reading Problems. Sticht, Fox, Hauke, & Zapf (1977a), in a survey of Navy students, found that about 20 percent experienced reading problems such as low skills, difficult material, poor preparation, and lack of motivation. As a result, Sticht et al. (1977b) outlined a general development plan for a job-related reading program and its later integration into the Navy's job skills training program. Instructors and job performers had felt that only half the information in correspondence courses was relevant to job performance. Studies by Aiken, Duffy, and Nugent (1977) and Duffy and Nugent (1978) foreshadow a basic skills training program with an important reading component presently under development at the Navy Personnel Research and Development Center (NAVPERSRANDCEN). This reading component will provide functional literacy preparation for marginal personnel. The program has long-range implications for increasing the effectiveness and completion rates of Navy correspondence courses.

2. Reading Levels--Texts. The reading grade levels (RGLs) of more recent correspondence texts used in the Navy promotion process range from the seventh grade to graduate level, with most texts around grade 13 (Biersner, 1975) and grade 12 (Carver, 1974). Duffy and Nugent's (1978) estimate of the median reading ability measure for a sample of Navy recruits at a 10.7 RGL indicates a gap between levels of reading ability and reading materials. Such a gap must later impact on CC completion rates. However, the obvious solution--to reduce the RGL of Navy manuals to match the average RGL of Navy personnel--is an oversimplification that is often disappointing and expensive (Biersner, 1975; Aiken et al., 1977). In spite of this, lower readability levels may be significant in encouraging the student, and eliminating at least high levels of readability may well be worth the effort, as indicated by a correlation of .75 between readability and completion (Klare & Smart, 1973).

Several programs stress the need to improve the writing of manuals and other documents for use as information sources. For example, Braby (1977), in establishing a dialogue with the Navy Technical Information Presentation Program, assessed the need for more effectively designed and written technical manuals to provide better support for Navy training requirements. Such programs as the Document Design Project, American Institute for Research, which seeks to foster better design and writing of public documents, may have future implications for improving correspondence courses.

3. Conceptual Level of Test Questions. Biersner and Doucette (1976) found no difference in readability between samples of questions with high and low error rates taken from a Navy CC text. They found that the conceptual level (thinking) required to answer these questions was positively related to the question-error rate and suggest the use of more but graduated high-level questions.

4. Text Search vs. Text Study. Long and Stolfi (1976) decry text search for answers to questions versus text study as a basis for answering IKOR questions, and conclude that Navy CCT needs overhauling to include elements that promote learning.

5. Underlining as Learning Strategy. Huff, Sticht, and Joyner (1977) found that both Navy and Air Force CC students used "underlining" most frequently and "outlining and drawing" least frequently. Underlining may be the simplest and most used strategy, but it is certainly not the most effective (Idstein & Jenkins, 1972).

6. Elective Remediation. Durnin, Montague, Ellis, and King (1978) concluded that some students (perhaps bright ones) may perform well under elective remediation, while others do not.

7. Structuring Materials. Lahey and Coady (1978) and Wulfeck (1976) observed that Navy students generally lack the ability to structure learning materials, an important factor in learning from correspondence texts.

College and CC Attrition Research

An extensive review of college attrition studies from 1950 to 1975 (Pantages and Creedon, 1978) provides a perspective from which to view the CC attrition problem. The national college completion rate of about 70 percent is higher than that of CCT, but the CCT rate still presents a serious problem. Most of the findings in this review are compared with findings from CCT research.

1. Academic Factors. High school rank, grade point average, and scholastic aptitude are the most significant predictors of attrition in college, accounting for about 50 percent of the variance. Years of previous education correlates with CCT completion. The Childs (1963) study also indicates, albeit weakly, that mental ability is a factor in course completion.

2. Instructor Role. The relationships between the college student and his instructors are crucial in preventing attrition. In current CCT practice, the instructor role is largely unfilled.

3. Motivation. Motivation is critical in both college and CCT, but specific motivational variables highly related to attrition have not been isolated.

4. Proximity of Residence. College students living off-campus are more likely to drop out than are students living on campus. The farther a student lives from a correspondence school center, the more likely he is to drop out (Donehower, 1968).

5. Poor Study Habits. Poor study habits are an obvious factor leading to college attrition. The effect of this factor has not been so clearly delineated in CCT attrition.

6. Student Commitment. Student commitment to a college degree increases completion probability as much as a realistic and practical reason for CC enrollment does.

7. Sex and Age. Sex and age do not seem to be significant factors in college attrition. However, female students are less likely to drop CC than are males (Duby & Giltrow, 1978); and older students, less than younger ones (Donehower, 1968).

8. Other Factors. Some other factors, which are less relevant to CCT but significant for college attrition, are financial pressures, prestige of the college, and positive attitude toward the college.

One attrition factor emphasized in CCT research is not mentioned in the college attrition reviews; namely, the design of instructional materials. The major reason seems to be the role of the college instructor in guiding and assisting the students to master the instructional material, whatever its quality.

From the above, it appears that the major factors in CC attrition are highly similar to, if not identical with, those identified in college attrition. They are poor scholastic ability, poor or nonexistent student-instructor relationships, poor study habits, poor goal clarity and commitment, and poor motivation.

CONCLUSIONS

1. The findings of this survey indicate that course noncompletion or attrition is the foremost problem in CCT today, as it has been for the past 80 years.

2. The primary cause of attrition in CCT, as in college education, is the inability of the students to effectively organize and conduct the information processing necessary to complete the course. CC students, unlike college students, must individually motivate themselves and structure their unsupervised study efforts.

RECOMMENDATIONS

1. Current CCT organizations should ensure that as many of the 24 course completion factors listed on pages 10 and 11 are present as possible. These include making course consequences job-related, aligning the subject matter of the courses and current on-the-job training, exerting command pressure, and using high quality course materials.

2. These same course completion factors should be refined, augmented, and validated in the CCT systems surveyed. A central agency in the government or in the civilian sector (such as the National Home Study Council) should coordinate this effort.

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APPENDIX A

CORRESPONDENCE COURSE TRAINING ORGANIZATIONS SURVEYED

CORRESPONDENCE COURSE TRAINING ORGANIZATIONS SURVEYED

Navy

Naval Educational and Training Program Development Center
Officer Correspondence Courses/Nonresident Career Courses
Ellyson Field
Pensacola, FL 32509

Defense Activity for Nontraditional Educational Support
Independent Study Division
Ellyson Field
Pensacola, FL 32509

The United States Naval War College
Center for Continuing Education
Newport, RI 02890

Naval Health Sciences Education and Training Command
Officer Correspondence Courses
National Naval Medical Center
Bethesda, MD 20014

U. S. Navy Dental Corps
Officer Correspondence Courses
National Naval Dental Center
Bethesda, MD 20014

Naval Postgraduate School
Officer of Continuing Education
Monterey, CA 93940

Marines

The Marine Corps Institute
Marine Barracks
Box 1775
Washington, D.C. 20013

Extension School
Education Center
MCDEC, Quantico, VA 22134

Other

The Institute for Professional Development
U. S. Army Training Support Center
Fort Eustis, VA 23604

Extension Course Institute
Air University
Gunter Air Force Station
Alabama 36118

The Coast Guard Institute
Oklahoma City, OK 73125

National Defense University
External Programs Directorate
Fort Lesley J. McNair
Washington, D.C. 20319

U. S. Postal Service
Field Programs Branch
Norman, OK 73070

National Independent Study Center
U. S. Civil Service Commission
Bldg. 20, Denver Federal Center
Denver, CO 80225

Federal Aviation Administration
Correspondence Study Program
Aeronautical Center
Oklahoma City, OK 73125

McGraw-Hill Continuing Education Center
3939 Wisconsin Ave., NW
Washington, D.C. 20016

National Home Study Council
1601 - 18th St., NW
Washington, D.C. 20009

APPENDIX B

PROBLEM IDENTIFICATION QUESTIONNAIRE

PROBLEM IDENTIFICATION QUESTIONNAIRE

Part One

1. To select the research problem whose solution will have the greatest impact (best return on the research investment and best chance of implementation) on correspondence course training, it is first necessary to determine what problems are considered critical by the correspondence course training community. Based on your experience, please list or describe what you consider to be the three or four most critical problems in correspondence course training today. Preferably, these should be problems for which there are no readily available or acceptable solutions--or problems where the solutions in use or proposed are too expensive, too cumbersome, or have other defects. Please list your problems in order of their importance.

Problem #1:

Problem #2:

Problem #3:

Problem #4:

Part Two

2. Please indicate how strongly you agree or disagree with the following statements as they pertain to your CCT system.

___ a. The average level of student knowledge at course completion is too low.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ b. Too many students take too long to complete a course.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ c. The number of students who do not complete their courses is too high.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ d. The average level of long term (3-6 months) retention of acquired knowledge after course completion is too low.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ e. Student attitudes toward the course teaching method is poor.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ f. Too many students do not have the necessary prerequisites for the courses they select.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ g. The content of the courses is not directly relevant to performance of the jobs they cover.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ h. The make-up and/or administration of courses are conducive to student cheating.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ i. The make-up and/or administration of courses are conducive to text search for answers to questions rather than text study.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ j. The cost per course completion is too high.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ k. The teaching method used puts most of the learning burden on the student.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ l. In general, the correspondence courses offered do a poor job in motivating the students to learn.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

___ m. Delay in responding to student input is the most important factor contributing to noncompletion of courses.

strongly agree	agree	inclined to agree	don't know	inclined to disagree	disagree	strongly disagree

(Please write in and evaluate any other problem statement that you feel should be included.)

Comments:

Now, please review those statements that you marked on the agree side and rank them in order of their importance by placing the appropriate number beside the letter designator.

APPENDIX C

STRUCTURED INTERVIEW FORM

STRUCTURED INTERVIEW FORM

Conditions and State of the CCTS

1. Title of CCTS
   a. Location
   b. Area serviced
   c. Populations serviced
2. Titles of system documents (catalogues, etc.)
3. CCTS objectives
4. Courses offered
   a. Number
   b. Description or titles
5. Enrollment procedures
6. Course completion times
7. Disenrollment definitions
8. Course development procedures--see Appendix A (page C-3)
9. Course development technical support
10. Updating course materials
11. Course instructional delivery system
    a. Method
    b. Student feedback
    c. Student tracking/supervision
    d. Student incentives
    e. Criteria and testing--see Appendix B (page C-4)
12. Expected student working procedures
13. Student guides, aids, etc.
14. Auxiliary supplemental material or equipment
15. System administration-management
    a. Staff
       (1) Divisions
           (a) Number of personnel
           (b) Actions

16. Student records

    a. What information is recorded for each student
    b. Where-when-how

17. Student surveys

    a. Basic characteristics
    b. Results

18. System feedback

    a. From students on a voluntary basis
    b. From units that use students on the job

19. System state

    a. Present enrollment (breakdown)
    b. Number of students enrolled in 1977[1]
    c. Number of students disenrolled in 1977
    d. Number disenrolled for official cause in 1977
    e. Number disenrolled for nonresponse in 1977
    f. Number carried that were eligible for nonresponse disenrollment in 1977
    g. Number reenrolled in 1977
    h. Number of course completions in 1977
    i. Cost per:
        (1) Enrollment
        (2) Completion
        (3) Reenrollment
        (4) Disenrollment
    j. Other relevant costs

20. Other

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[1]If data for some other representative time period are available, please specify that time period and data.

APPENDIX A--COURSE DEVELOPMENT PROCEDURES

1. Title of CCTS

2. Developers

   a. Number
   b. Training-range and median
   c. Experience-range and median

3. Course selection

4. Course development procedure

   a. Development plan or model
   b. Subject matter expert
   c. Job analysis
   d. Objectives (terminal and enabling)
   e. Sequencing
   f. Text composition
   g. Integrated training procedures
      (1) Lesson size
      (2) Student responding
      (3) Feedback procedures
   h. Test design and construction
   i. Review procedures
      (1) Learner verification and revision
      (2) Job match
      (3) Internal review
   j. Reproduction mechanics
   k. Updating
      (1) When
      (2) Procedure
      (3) Consequences--administration, students, other
   l. Other elements of the correspondence course development process that should be included.

APPENDIX B--CRITERIA AND TESTING

1. Lesson Tests

   a. Type
   b. Passing Score
   c. Mean Score
   d. Controlled
   e. Retake Frequency
   f. Type of Retake Test
   g. How and Where Scored
   h. Type of Test Feedback
   i. Feedback Time

2. Final Test

   a. Type
   b. Passing Score
   c. Mean Score
   d. Controlled
   e. Retake Frequency
   f. Type of Retake Test
   g. How and Where Scored
   h. Type of Test Feedback
   i. Feedback Time

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Commanding Officer, Naval Education and Training Program Development Center (Technical Library) (2)
Commanding Officer, Naval Education and Training Support Center, Pacific
Commanding Officer, Naval Training Equipment Center (Technical Library)
Director, Career Information and Counseling School (Code 3W34)
Director, Defense Activity for Non-Traditional Education Support
Director, Management Information and Instructional Activity Branch Office, Memphis
Director, Naval Civilian Personnel Command
Director, Training Analysis and Evaluation Group (TAEG)
Officer in Charge, Central Test Site for Personnel and Training Evaluation Program
Superintendent, Naval Postgraduate School
Commander, Army Research Institute for the Behavioral and Social Sciences, Alexandria (PERI-ASL)
Chief, Army Research Institute Field Unit, Fort Harrison
Commander, Air Force Human Resources Laboratory, Brooks Air Force Base (Scientific and Technical Information Office)
Commander, Air Force Human Resources Laboratory, Lowry Air Force Base (Technical Training Branch)
Commander, Air Force Human Resources Laboratory, Williams Air Force Base (AFHRL/OT)
Commander, Air Force Human Resources Laboratory, Williams Air Force Base (CNET Liaison Office AFHRL/OTLN)
Commander, Air Force Human Resources Laboratory, Wright-Patterson Air Force Base (AFHRL/LR)
Commander, 314 Combat Support Group, Little Rock Air Force Base (Career Progression Section)
Superintendent, U.S. Coast Guard Academy
Defense Technical Information Center (DDA) (12)